

What is claimed is:

1. A device, used in a communication apparatus, for generating a mediate ring information and playing a ring signal based on said mediate ring information, said device comprising:
 - 5 a receiving module for receiving an audio digital signal;
 - a processing module for dividing the audio digital signal into a plurality of sub-signals in a predetermined period, and transferring the plurality of sub-signals into a plurality of sets of frequency spectrums, respectively;
 - 10 an analyzing module for retrieving at least one frequency with the largest amplitude in each of the plurality of sets of frequency spectrums, respectively, and storing the retrieved frequencies in series to generate said mediate ring information;
 - a storage module for storing the mediate ring information and a plurality of predetermined tone information; and
 - 15 a playing module for retrieving the mediate ring information and one of the plurality of predetermined tone information from the storage module, generating the ring signal based on the retrieved mediate ring information and the retrieved predetermined tone information, and playing the ring signal.
- 20 2. The device of claim 1, further comprising an editing module capable of selectively editing the mediate ring information.
3. The device of claim 1, further comprising:
 - 25 a recording module for recording an external audio source into an audio analog signal; and

an analog/digital converting module for converting the audio analog signal into the audio digital signal.

4. The device of claim 1, wherein the processing module performs the transferring of the plurality of sub-signals into the plurality of sets of frequency spectrums, respectively, by a fast Fourier transformation (FFT).
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5. The device of claim 1, wherein the storage module comprises a first storage module and a second storage module, the first storage module functions storing said mediate ring information, and the second storage module functions storing the plurality of predetermined tone information.
- 10 6. The device of claim 1, wherein the playing module, responsive to an incoming call received by the communication apparatus, functions retrieving said mediate ring information and one of the plurality of predetermined tone information from the storage module, generating the ring signal based on the retrieved mediate ring information and the retrieved predetermined tone information, and playing the ring signal.
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7. A method for generating a mediate ring information and generating a ring signal based on the mediate ring information in a communication apparatus, a plurality of predetermined tone information being previously provided, the method comprising the steps of:
 - 20 (a) receiving an audio digital signal;
 - (b) dividing the audio digital signal into a plurality of sub-signals in a predetermined period;
 - (c) transferring the plurality of sub-signals into a plurality of sets of frequency spectrums, respectively;

(d) retrieving at least one frequency with the largest amplitude in each of the plurality of sets of frequency spectrums, respectively;

(e) storing the retrieved frequencies in series to generate the mediate ring information; and

5 (f) retrieving the mediate ring information and one of the plurality of predetermined tone information, and generating the ring signal based on the retrieved mediate ring information and the retrieved predetermined tone information.

8. The method of claim 7, between the step (e) and the step (f), further comprising
10 the step of:

(f-1) selectively editing the mediate ring information.

9. The method of claim 7, before the step (a), further comprising the steps of:

(a-1) recording an external audio source into an audio analog signal; and
(a-2) converting the audio analog signal into the audio digital signal.

15 10. The method of claim 7, wherein the step (c) is performed by a fast Fourier transformation (FFT).

11. The method of claim 7, wherein the step (f) is performed in response to an incoming call received by the communication apparatus, and after the step (f), further comprising the step of playing said ring signal.